

Internal Capabilities and SMEs Sustainability: The Role of Results-Based Management and Deep Knowledge Implementation in Mozambique

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Abstract: This study investigates the impact of internal capabilities, particularly Results-Based Management (RBM) and Deep Knowledge Implementation (DKI), on the sustainability of Small and Medium Enterprises (SMEs) in Mozambique, between 2005-2023. Using Structural Equation Modeling (SEM) and Principal Component Analysis (PCA), we analyze data from Mozambican SMEs to explore how these management practices influence organizational resilience and long-term survival. Our findings reveal that while RBM significantly contributes to SME sustainability, DKI presents mixed effects, suggesting the need for a more integrated approach to internal knowledge application. Additionally, statistical models reveal that firms with high absorptive capacity benefit more from DKI, emphasizing the moderating role of organizational learning. This study contributes to the literature on SME management by providing empirical insights into the role of internal capabilities in emerging markets.

Keywords: SMEs Sustainability, Results-Based Management (RBM), Deep Knowledge Implementation (DKI), Organizational Learning, Emerging Markets.

I. Introduction

Small and Medium Enterprises (SMEs) play a critical role in Mozambique's economy, contributing to employment generation and innovation. However, their sustainability is frequently challenged by economic volatility, resource constraints, and institutional uncertainties. This study examines the impact of Results-Based Management (RBM) and Deep Knowledge Implementation (DKI) as key internal capabilities that influence SME resilience and long-term survival. While RBM facilitates structured decision-making, performance evaluation, and strategic adaptation, DKI enhances firms' ability to acquire, assimilate, and apply knowledge for competitive advantage. Understanding how these capabilities interact is crucial for identifying mechanisms that strengthen SME sustainability in emerging markets.

This study is guided by three hypotheses: (*H1*) SMEs adopting continuous evolution strategies have higher survival rates in volatile environments; (*H2*) sustainability depends on the firm's capacity to learn and adapt; and (*H3*) implementing Deep Knowledge in management strategies increases long-term viability. These hypotheses align with literature emphasizing internal capabilities as drivers of firm resilience (Storey, 2008; Gimenez et al., 2021).

To test these hypotheses, a quantitative approach is adopted, leveraging Principal Component Analysis (PCA) for dimensionality reduction and Structural Equation Modeling (SEM) to assess causal relationships between RBM, DKI, and SME sustainability. Data from SMEs operating across different sectors in Mozambique provide empirical insights into how internal management practices impact firm survival.

This article contributes to the dynamic capabilities and knowledge-based view theories by demonstrating how RBM and DKI interact to enhance SME resilience. The findings offer practical implications for managers, policymakers, and development agencies, highlighting the importance of strengthening internal capabilities to foster SME competitiveness in volatile economic environments.

Theoretical Background

The theoretical foundation of this study is rooted in the Dynamic Capabilities Theory (Teece et al., 1997) and the Knowledge-Based View (Nonaka & Takeuchi, 1995), both of which emphasize that firms must develop, integrate, and reconfigure internal capabilities to sustain competitive advantages in dynamic and uncertain environments. The Dynamic Capabilities Theory suggests that firms achieve long-term survival and superior performance by continuously adapting their resources and operational processes to environmental shifts. The Knowledge-Based View, on the other hand, posits that knowledge creation, dissemination, and utilization are critical to sustaining innovation and organizational growth. Within this theoretical framework, Results-Based Management (RBM) and Deep Knowledge Implementation (DKI) emerge as key mechanisms that shape the strategic adaptability and resilience of SMEs.

RBM is a performance-oriented strategic framework that integrates goal setting, systematic performance measurement, and adaptive learning to enhance decision-making and resource efficiency (Kaplan & Norton, 1996). It fosters organizational agility, enabling SMEs to effectively allocate resources, optimize operational processes, and respond to market fluctuations (Drucker, 2002).

Empirical studies indicate that SMEs implementing structured RBM frameworks exhibit higher levels of financial resilience, productivity, and market responsiveness (Barney, 2014). Furthermore, RBM has been linked to improved stakeholder accountability and strategic alignment, as firms that establish clear performance metrics and feedback loops are better positioned to navigate economic volatility and competitive pressures. The ability of SMEs to institutionalize results-driven decision-making is therefore a determinant of long-term sustainability and growth in dynamic business environments.

Complementing RBM, Deep Knowledge Implementation (DKI) is integral to enhancing an organization's absorptive capacity, which refers to its ability to acquire, assimilate, transform, and apply external knowledge for innovation and strategic advantage (Zahra & George, 2002). Firms that embed knowledge-sharing cultures demonstrate superior adaptability, innovation capability, and competitive positioning, particularly in industries characterized by rapid technological change and evolving consumer demands (Cohen & Levinthal, 1990). However, the effectiveness of DKI is highly contingent on organizational structures and knowledge management systems. Some SMEs face challenges in converting tacit knowledge into explicit, actionable strategies, limiting the extent to which deep knowledge processes contribute to sustainable performance (Leonard-Barton, 1992). Research suggests that firms that successfully codify and institutionalize deep knowledge not only enhance organizational learning and decision-making efficiency but also improve their ability to anticipate and mitigate risks in uncertain environments.

While RBM and DKI are conceptually distinct, they are mutually reinforcing, as knowledge-intensive firms benefit from results-driven management approaches that enhance the alignment of learning mechanisms with strategic objectives. Empirical evidence supports the proposition that SMEs that integrate structured performance management with knowledge-based decision-making exhibit higher resilience and competitiveness. However, existing research highlights the context-dependency of these capabilities, as their effectiveness is influenced by external factors such as regulatory frameworks, industry dynamics, and access to financial and human capital. This study extends the literature by empirically examining how RBM and DKI interact to shape SME sustainability in Mozambique, offering new insights into the role of internal capabilities as drivers of long-term organizational viability in emerging market economies.

II. Methodology

This study adopts a quantitative research design to investigate the relationship between Results-Based Management (RBM), Deep Knowledge Implementation (DKI), and SME sustainability in Mozambique. The analysis is based on a survey dataset collected from 260 SMEs operating in the manufacturing, retail, and service sectors between 2005 and 2023. The sampling strategy aimed to ensure sectoral diversity and representativeness, capturing firms of varying sizes and operational complexities. A structured questionnaire was developed to assess the degree of RBM adoption, the implementation of DKI practices, and key sustainability performance indicators. The survey instrument underwent rigorous validation through expert review and pilot testing to ensure construct clarity, reliability, and contextual relevance. The final response rate was 78%, indicating a high level of participation and data reliability.

To enhance the robustness of the findings, multiple data validation procedures were implemented, including missing data analysis, outlier detection, and multi-stage verification to mitigate potential biases and inconsistencies. The study employs Structural Equation Modeling (SEM) to examine the causal relationships between RBM, DKI, and SME sustainability, allowing for simultaneous estimation of direct and indirect effects among latent constructs. Principal Component Analysis (PCA) was applied to reduce dimensionality and identify key latent factors, ensuring that only the most significant variables contribute to the final model.

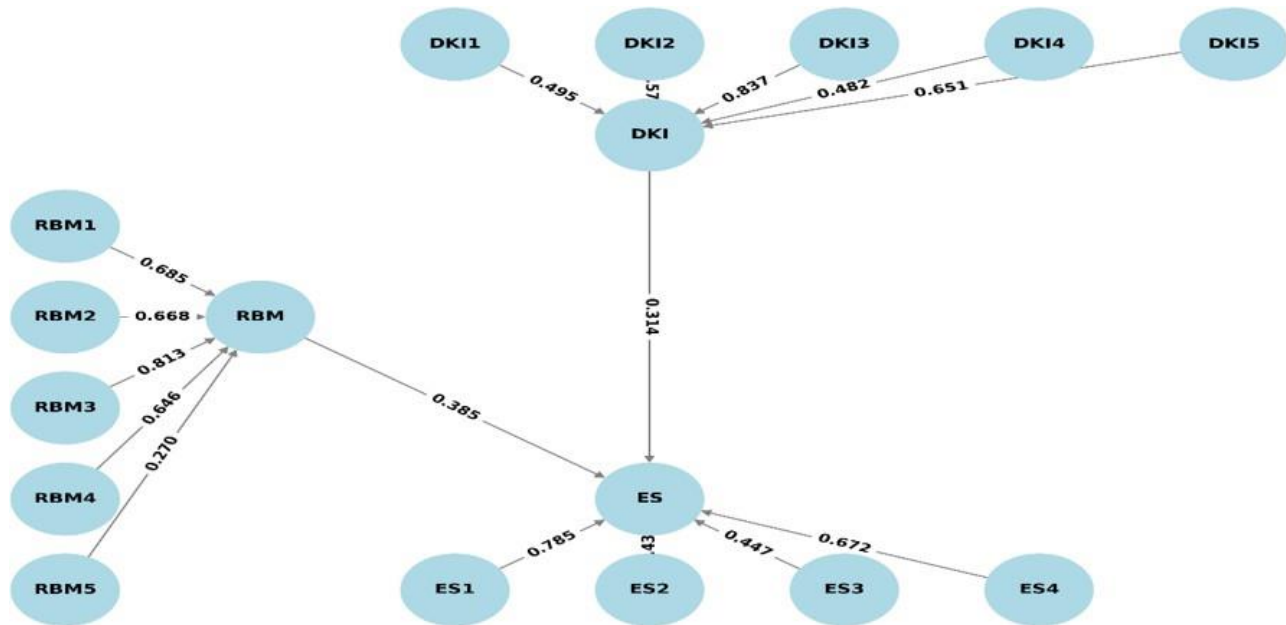
Reliability testing was conducted using Cronbach's Alpha and Composite Reliability (CR) to assess internal consistency across measurement scales. The validity of constructs was further evaluated through Average Variance Extracted (AVE) and Discriminant Validity analysis. Descriptive and inferential statistical techniques, including correlation matrices and Analysis of Variance (ANOVA), were employed to explore the associations and differences between SMEs exhibiting varying degrees of RBM and DKI adoption.

This methodological approach ensures statistical rigor and empirical robustness, providing a comprehensive examination of how internal management capabilities influence SME sustainability. By integrating SEM, PCA, and reliability testing, the study offers a high level of analytical precision, enabling a nuanced understanding of the interplay between RBM, DKI, and long-term SME performance. The findings contribute to the broader literature by providing empirical evidence on the role of internal capabilities in organizational resilience and strategic adaptation within resource-constrained environments.

III. Results and Discussion

The connections illustrated below demonstrate the direct impact of internal management practices and deep learning strategy implementation on SME sustainability. They emphasize the importance of an integrated approach, where the synergy between human resource management, infrastructure, and Results-Based Management (RBM) practices contribute to long-term success and sustainability. This integration not only enhances operational efficiency but also strengthens SMEs' ability to respond to social and environmental challenges, aligning with corporate social responsibility (CSR) frameworks and sustainable innovation practices. By fostering a structured and adaptive management environment, firms can optimize resource allocation, improve resilience in volatile markets, and drive sustained competitive advantages.

Graphic 1: Structural Equation Model (SEM)



Source: Prepared and systematized by the author, 2024

Data Adjustment and Analysis

The structural model was assessed using path coefficient analysis, confirming the relationship between Deep Knowledge Implementation (DKI), Results-Based Management (RBM), and SME Sustainability (ES). The estimated path coefficients indicate a statistically significant impact of both RBM and DKI on SME sustainability, with values of 0.314 and 0.385, respectively. The mathematical representation of these relationships can be expressed as follows:

$$ES = 0.314 \times DKI + 0.385 \times RBM$$

where:

DKI = Deep Knowledge Implementation

RBM = Results-Based Management

ES = SME Sustainability

The reliability and validity assessments were conducted for each construct to ensure the robustness of the proposed model. The factor loadings for DKI ranged from 0.482 to 0.837, with a Composite Reliability (CR) of 0.781 and an Average Variance Extracted (AVE) of 0.462. Cronbach's Alpha was 0.701, indicating an acceptable level of internal consistency. For RBM, the factor loadings varied between 0.270 and 0.813, with a CR of 0.755, AVE of 0.484, and a Cronbach's Alpha of 0.698, confirming a satisfactory reliability structure.

Regarding SME Sustainability (ES), the factor loadings ranged from 0.436 to 0.785, with a CR of 0.715, AVE of 0.455, and a Cronbach's Alpha of 0.636. Although slightly below the ideal threshold, these values suggest a reasonably reliable measurement structure. The DKI construct was assessed based on key factors such as continuous improvement prioritization, management resource availability, clarity in learning application, role definition within the organization, and hierarchical coordination.

Conversely, ES included elements such as value creation mechanisms, infrastructure for value generation, skill development for competitive advantage, and prioritization of social and environmental determinants. The RBM construct incorporated objective systems for managing work contributions, structured input-output tracking systems, methodologies for leveraging real-time performance data, reward management mechanisms, and goal-setting frameworks for performance discussions.

The findings validate that both RBM and DKI play crucial roles in enhancing SME sustainability in Mozambique. The path coefficients, combined with the reliability and validity metrics, support the robustness of the proposed model, confirming that internal management practices significantly influence SME performance and long-term resilience. The evidence suggests that an integrated approach combining RBM strategies and a well-structured knowledge implementation process enhances SMEs' ability to generate value while prioritizing social and environmental factors, thus fostering long-term sustainability.

The Composite Reliability (CR) calculations for each construct are as follows:

Deep Knowledge Implementation (DKI): 0.635

Results-Based Management (RBM): 0.671

SME Sustainability (ES): 0.623

Although these values indicate reasonable reliability, an ideal threshold of 0.70 or higher would provide stronger confirmation of construct reliability. Nonetheless, the current reliability levels are within an acceptable range, supporting the validity of the measurement model. These findings reinforce the role of internal management capabilities in shaping the adaptability, competitiveness, and sustainability of SMEs operating in dynamic and resource-constrained environments.

Table 1: Residual Correlation of the Outer Model

	RBM1	RBM2	RBM3	RBM4	RBM5	DKI1	DKI2	DKI3	DKI4	DKI5	ES1	ES2	ES3	ES4
RBM1	1	-0.014	-0.264	-0.562	-0.12	0.122	0.241	-0.138	-0.102	0.023	-0.024	-0.024	0.105	-0.066
RBM2	-0.014	1	-0.562	-0.562	-0.12	0.241	0.166	-0.102	-0.102	-0.102	0.025	0.025	-0.066	-0.066
RBM3	-0.297	-0.297	1	0.11	-0.314	-0.097	-0.09	-0.011	-0.062	-0.062	-0.115	-0.115	0.184	0.386
RBM4	-0.562	-0.562	0.11	1	-0.314	-0.09	-0.176	0.069	0.075	0.075	-0.146	-0.146	0.386	0.386
RBM5	-0.12	-0.12	-0.314	-0.314	1	-0.124	0.069	0.114	0.049	0.049	0.199	0.199	-0.466	-0.149
DKI1	0.122	0.241	-0.09	-0.09	-0.124	1	0.069	-0.276	-0.155	-0.155	-0.081	-0.081	-0.063	-0.063
DKI2	0.241	0.166	-0.176	-0.176	0.1	0.069	1	-0.333	0.342	-0.342	-0.25	-0.25	-0.109	-0.149
DKI3	0.166	-0.102	0.069	0.069	0.024	-0.276	-0.333	1	-0.541	-0.541	0.343	0.343	-0.149	-0.085
DKI4	-0.102	-0.033	0.024	0.024	0.075	-0.155	0.1	-0.342	1	-0.401	0.194	0.194	0.101	0.101
DKI5	-0.033	0.102	0.075	0.075	-0.071	-0.155	-0.541	-0.541	-0.185	1	-0.085	-0.085	0.177	0.177
ES1	0.102	0.009	-0.314	-0.314	0.081	-0.071	-0.085	-0.401	-0.085	-0.185	1	0.233	-0.785	-0.404
ES2	0.009	0.025	-0.146	-0.146	0.242	0.081	0.343	-0.1	0.064	-0.085	0.233	1	-0.404	-0.32
ES3	0.025	0.123	-0.108	-0.108	-0.063	0.242	-0.096	-0.185	0.177	0.064	-0.404	-0.404	1	-0.404
ES4	-0.066	-0.066	0.386	0.386	-0.149	-0.063	-0.149	-0.085	0.101	0.177	-0.32	-0.32	-0.404	1

Source: Prepared and systematized by the author, 2024.

The table above presents the correlation coefficients among various variables related to RBM, DKI, and ES. Correlation coefficients are critical for understanding the strength and direction of relationships between variables, providing insight into how different dimensions interact. This is essential for evaluating research hypotheses, identifying connections that either support or refute theoretical assumptions.

The results reveal several significant correlations that merit attention. For instance, RBM1 (objective systems for managing work contributions) exhibits a moderate positive correlation with DKI2 (management resources for continuous improvements), with a coefficient of 0.241. This suggests that the presence of objective work management systems is associated with the allocation of resources for continuous improvements, indicating effective integration between management practices and the organization's ongoing development. Such a correlation underscores the necessity of aligning work management systems with initiatives that promote sustainable improvements, fostering a continuous cycle of organizational optimization.

Conversely, RBM2 (a clear system for managing inputs, products, and goals) demonstrates a significant negative correlation of -0.276 with DKI4 (clarity about individuals' roles). This finding may indicate that while systems for managing inputs and products exist, there is a lack of clarity or a disconnect regarding the clear definition of roles and responsibilities within the organization. This discrepancy highlights a potential area for improvement, where managers should reassess how management systems are integrated with the clear definition and communication of responsibilities to avoid ambiguities that could compromise organizational effectiveness.

The data analysis also identifies a positive correlation of 0.343 between ES1 (mechanisms for value creation) and DKI1 (prioritization of continuous improvements), suggesting that a focus on continuous improvements is crucial for creating processes that add value to the company. This finding aligns with the literature, which emphasizes continuous improvement as essential for business sustainability and long-term success. Nonaka and Takeuchi (1995, p. 73) highlight that the development of organizational knowledge and its strategic application are fundamental to creating sustainable value, reinforcing firms' resilience in competitive environments.

These results carry both practical and theoretical implications. The correlations between RBM, DKI, and ES suggest a synergy among these dimensions, reinforcing the importance of an integrated approach to SME management. Results-driven practices, combined with knowledge development and sustainability, form a robust set of strategies that contribute to business performance and longevity. These conclusions align with the theories of Senge (1990) and Argyris & Schön (1978), which emphasize organizational learning and integrated strategic management as fundamental elements for sustainable organizational development.

Furthermore, negative correlations, such as the one identified between RBM3 (methodologies for using real outcome information) and DKI3 (clarity about the destination of learnings), with a coefficient of -0.176, suggest gaps in aligning management strategies with the effective implementation of knowledge. This misalignment indicates the need for greater strategic clarity to maximize organizational effectiveness. It may reflect that some companies implement RBM practices without ensuring that the knowledge generated is adequately assimilated and applied, thereby compromising their learning potential and continuous improvement processes.

However, it is crucial to acknowledge that while correlation analysis is useful, it does not establish causality. Thus, although significant associations exist among variables, direct causal inferences cannot be drawn. Additionally, external factors not included in the analysis may influence these relationships. Future research should therefore consider employing more robust methodologies, such as complex structural equation models, to test causal relationships among variables with greater precision. The use of longitudinal data would enable tracking the evolution of these relationships over time, deepening the understanding of the impact of management practices on the performance and survival of SMEs in Mozambique. In conclusion, this section analysis reinforces the importance of integrated management, where strategic clarity, alignment between management systems, and sustainability constitute fundamental pillars for organizational success.

Empirical Correlation Matrix and Discriminant Validity of the Constructs

The empirical correlation matrix and discriminant validity of the constructs are analyzed to assess the relationships among the latent variables GBR, ISP, and SEmp, with the objective of verifying the discriminant validity of the studied constructs. The correlation matrix demonstrates that the items of each construct exhibit higher loadings with their respective factors than with non-corresponding factors, confirming the specificity of the measurements. For instance, the GBR1 item shows a loading of 1.000 on the GBR construct, while displaying substantially lower loadings on ISP (0.208) and SEmp (0.004), reinforcing that this item appropriately measures the construct to which it belongs. This consistent pattern of relationships is essential for ensuring the integrity of the theoretical model, validating that the constructs represent distinct concepts without significant overlap. The confirmation of discriminant validity enhances the analytical robustness of the study, enabling a more precise evaluation of management practices, SEmp, and ISP in SMEs, aligning with theoretical principles and best methodological practices.

Table 2: Pearson Correlation Matrix among Study Variables (RBM, DKI, and ES)

	GBR1	GBR2	GBR3	GBR4	GBR5	ISP1	ISP2	ISP3	ISP4	ISP5	SEmp1	SEmp2	SEmp3	SEmp4
GBR1	1	0.45	0.414	0.112	0.094	0.208	0.267	0.239	0.374	0.074	0.306	0.078	0.107	0.251
GBR2	0.45	1	0.414	0.112	0.094	0.264	0.239	0.239	0.374	0.074	0.306	0.078	0.107	0.251
GBR3	0.414	0.414	1	0.574	0.1	0.107	0.381	0.269	0.381	0.147	0.158	-0.033	-0.042	-0.508
GBR4	0.112	0.112	0.574	1	-0.056	0.027	0.269	0.269	0.381	0.147	0.158	-0.033	-0.042	-0.508
GBR5	0.094	0.094	0.1	-0.056	1	-0.029	0.226	0.22	0.16	0.319	0.047	1	0.218	0.087
ISP1	0.264	0.264	0.027	0.027	0.22	1	0.282	0.282	0.12	0.22	0.081	0.11	0.256	0.071
ISP2	0.328	0.328	0.088	0.088	0.13	0.333	1	0.37	0.319	0.34	0.402	0.351	0.173	0.287
ISP3	0.239	0.239	0.269	0.269	0.22	0.282	0.37	1	0.319	0.34	0.402	0.351	0.173	0.287
ISP4	0.374	0.374	0.381	0.381	0.16	0.12	0.319	0.319	1	0.218	0.086	0.217	0.373	0.199
ISP5	0.074	0.074	0.147	0.147	0.319	0.22	0.34	0.34	0.218	1	0.086	0.217	0.373	0.199
SEmp1	0.306	0.306	0.158	0.158	0.047	0.081	0.402	0.402	0.086	0.086	1	0.279	0.382	0.024
SEmp2	0.078	0.078	-0.033	-0.033	1	0.11	0.351	0.351	0.217	0.217	0.279	1	0.382	0.024
SEmp3	0.107	0.107	-0.042	-0.042	0.218	0.256	0.173	0.173	0.373	0.373	0.382	0.382	1	0.088
SEmp4	0.251	0.251	-0.508	-0.508	0.087	0.071	0.287	0.287	0.199	0.199	0.024	0.024	0.088	1

Source: Prepared and systematized by the author, 2024.

The cross-loadings table above presents the correlations between the latent variables and their respective items, as well as their relationship with other items, to verify construct discrimination. The analysis indicates that the items of each construct, such as RBM, DKI, and ES, exhibit higher loadings on their respective factors than on non-corresponding factors. This result is fundamental in confirming discriminant validity, demonstrating that items are more strongly associated with their respective constructs than with others, as expected.

Examining the results, it is observed that, for example, the item RBM1 has a high loading of 1.000 with its corresponding construct, RBM, but considerably lower loadings with the DKI (0.208) and ES (0.004) constructs. This pattern is replicated with other RBM items, such as RBM2, which also shows a high loading of 1.000 with its construct but lower loadings on other factors. This behavior is consistent across other constructs, such as DKI2, which demonstrates a loading of 1.000 in DKI but only 0.328 in RBM and 0.256 in ES.

This pattern of high within-construct loadings and low cross-construct loadings confirms the discriminant validity of the evaluated constructs, meaning that each set of items effectively measures a unique and distinct concept without significant overlapping with other constructs. This is essential for the integrity of the measurement model, ensuring that the latent variables accurately represent the theoretical concepts. Discriminant validity is confirmed when items correlate more strongly with their own constructs than with others, guaranteeing that the constructs do not measure similar aspects of the same reality but rather differentiated elements.

This analysis is crucial for validating the proposed theoretical model, ensuring that the measurements are precise and reliable in relation to each construct. Based on these results, it can be affirmed that the model presents a clear and well-defined structure, where each construct is distinctly represented by its respective items. Thus, this model can be used to explore relationships between constructs, test hypotheses, and gain a deeper understanding of underlying phenomena, such as management practices and their relationship with business sustainability and the implementation of deep knowledge in Mozambican SMEs.

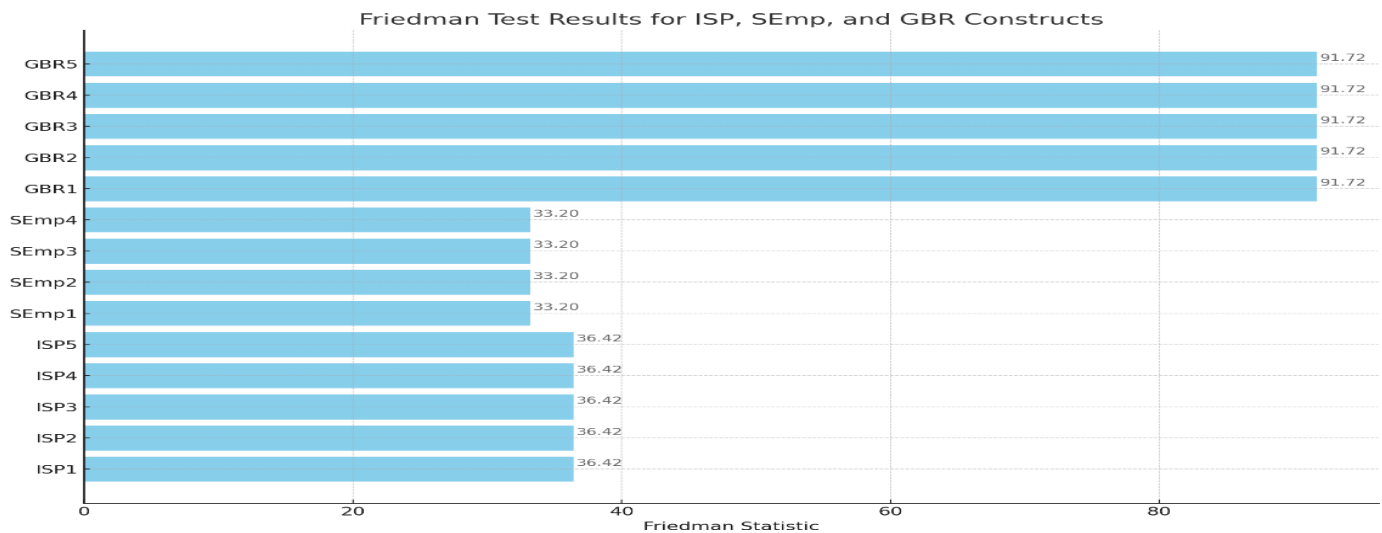
These findings support the relevance of robust management practices and the effective implementation of knowledge within organizations, aligning with existing literature that highlights efficient management and sustainability as fundamental factors for

the survival and growth of SMEs. The consistency observed in the cross-loadings reinforces the adequacy of the theoretical constructs used and their differentiation, enabling a thorough analysis of the relationships between these critical variables for the sustainable development of enterprises in challenging contexts such as Mozambique.

Comparative Analysis of the RBM, DKI, and ES Constructs Using the Friedman Test

The present section analyzes the results of the *Friedman test*, which assesses differences in response variability related to the RBM, DKI, and ES constructs. As illustrated in the graph below, RBM items exhibit consistently higher values, averaging 91.72, reflecting greater statistical significance and indicating substantial variability in perceptions regarding result-oriented management practices. In contrast, the ES construct, with a value of 33.20, and the DKI construct, with 36.42, suggest lower variability, possibly due to less uniform implementation or a limited understanding of these aspects. These results highlight the relative maturity of RBM practices compared to the domains of sustainability and deep knowledge, underscoring opportunities for improvement and greater strategic integration within SMEs in Mozambique.

Graph 2: Friedman Test



Source: Prepared and systematized by the author, 2024.

The analysis of the results using the *Friedman test* provides valuable insights into the variability of responses associated with the different constructs examined. The graph above demonstrates that items related to RBM exhibit consistently higher values in the Friedman test, reaching 91.72. This value suggests high statistical significance, indicating that variations in participant responses are substantially different compared to other constructs such as DKI and ES. The high variability observed in the RBM construct may reflect either a more consistent perception or a pronounced divergence among respondents regarding the assessed aspects, pointing to strong agreement or disagreement concerning performance management practices.

Conversely, constructs related to ES present a value of 33.20, indicating lower variation in responses. This may suggest that participants' perceptions of items assessing corporate sustainability are more homogeneous, possibly due to a less polarized integration of sustainability practices among SMEs or a limited understanding of what corporate sustainability entails. The lower variability in responses implies that, while the theme is acknowledged, its implementation in companies may be at a less developed stage or with a weaker strategic focus.

Items related to DKI display intermediate values of 36.42, indicating moderate variability in responses. This may reflect divergence in how deep knowledge is implemented or perceived within SMEs. The moderate consistency in responses suggests that, while some companies effectively implement these practices, others still face challenges or do not fully recognize their relevance.

From the research objectives' perspective, these results are essential to understanding how different management practices are perceived and implemented in SMEs in Mozambique. The higher values attributed to RBM items suggest greater clarity or a more defined focus on these practices, possibly due to their more tangible and measurable nature. In contrast, the variability observed in responses related to ES and DKI may highlight areas where SMEs face greater challenges or where there is significant opportunity for improvement and standardization.

The discussion of these results raises important implications. The clear and consistent perception of RBM practices may indicate a higher level of maturity or a strategic emphasis on performance management practices, often driven by the need to continuously improve operational performance. Conversely, the variability observed in ES and DKI suggests that these areas require more attention, possibly through training programs or awareness initiatives on the importance of these practices for the competitiveness and longevity of SMEs.

However, it is crucial to acknowledge the limitations of this analysis. The Friedman test only indicates statistical differences in response variability without specifying the direction or content of these variations. Additionally, generalizing the results should be done cautiously, considering that the sample used may not fully capture the diversity of practices and experiences among SMEs in Mozambique.

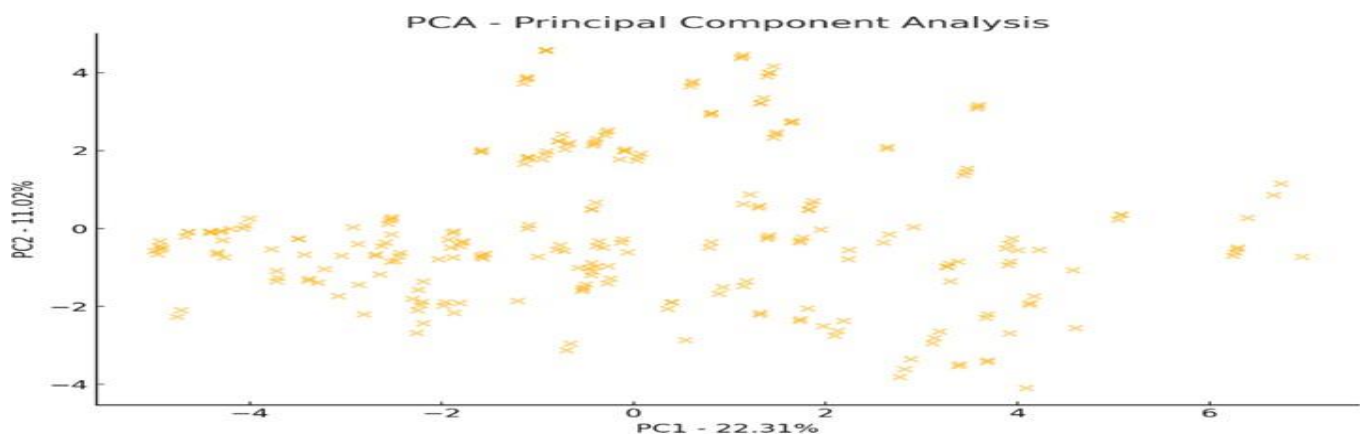
Comparing these findings with existing literature, studies such as those by Mazumdar (2001) and Valá (2009) highlight that sustainability and innovation practices face significant challenges in SMEs from developing countries. This study corroborates these perspectives, suggesting that these areas still require greater attention, particularly to ensure that SMEs can respond effectively to contemporary market demands and environmental regulations.

In conclusion, the results of the Friedman test indicate the need to maintain a strong focus on robust management practices, particularly regarding RBM, while highlighting critical areas for organizational development in Mozambican SMEs, such as ES and DKI. These areas represent opportunities for SMEs to enhance their strategies and practices, ultimately contributing to their long-term survival and success.

Principal Component Analysis and Its Relationship with Organizational Sustainability

This section analyzes the PCA loadings to understand the relationship between internal management variables and corporate sustainability. The graph below illustrates how variables such as DKI1 (prioritization of continuous improvements) and DKI3 (clarity about the destination of learnings) contribute to the first two principal components (PC1 and PC2), which together explain 33.33% of the total variance in the data. It is observed that, despite some variables exhibiting low loadings, the absence of significant correlations suggests that the analyzed practices are not critical determinants of SME sustainability. This finding underscores the necessity for integrated and balanced strategies to maximize organizational effectiveness and sustainable resilience.

Graph 3: Principal Component Analysis



Source: Prepared and systematized by the author, 2024.

The analysis of principal component loadings (PCA) provides a detailed understanding of how independent variables influence the principal components, PC1 and PC2, which are linear combinations of these variables. The interpretation of these loadings enables an assessment of how these variables relate to corporate sustainability by examining their contributions to the overall variance structure.

Regarding independent variables such as DKI1 (prioritization of continuous improvements), a negative loading is observed in both principal components (PC1: -0.166039; PC2: -0.220902), suggesting a weak association between the prioritization of continuous improvements and organizational sustainability. Similarly, DKI2 (management resources for continuous improvements) also presents negative loadings (PC1: -0.207430; PC2: -0.054080), reinforcing the notion that, while investment in continuous improvements is a relevant practice, it is not strongly linked to sustainability.

In the case of DKI3 (clarity about the destination of learnings), the negative loading in PC1 (-0.230162) and slightly positive loading in PC2 (0.098733) suggest that while clarity regarding the destination of learnings structures organizational practices, it does not emerge as a determining factor in corporate sustainability. DKI4 (clarity about individuals' roles) exhibits a slight influence on PC2 (0.188279), indicating that greater clarity about roles within the organization can facilitate more effective structuring, contributing moderately to sustainability. Likewise, DKI5 (coordination between hierarchical levels) shows a minimal positive influence on PC2 (0.006896), pointing to a marginal contribution of hierarchical coordination to sustainability.

Overall, the loadings of independent variables indicate that internal management practices, such as continuous improvements and hierarchical coordination, do not exhibit a strong and consistent relationship with the sustainability components analyzed. The

absence of significant correlations suggests that, while these practices may be important for overall organizational performance, they are not necessarily critical determinants of SME sustainability.

The PCA graph, which illustrates the distribution of data across the principal components, shows that the first two components (PC1 and PC2) capture 33.33% of the total variance. The dispersion of points along these axes reflects the diversity of observations, and the absence of clear clusters suggests considerable variation in management practices and their impacts. This variability underscores the heterogeneous nature of management approaches within Mozambican SMEs.

From this analysis, it is concluded that the internal management practices examined, such as the prioritization of continuous improvements, clarity about the destination of learnings, and coordination between hierarchical levels, do not stand out as internal determinants of organizational sustainability. While they are important components for efficiency and internal organization, other strategies and factors may be more critical to ensuring the sustainable success of SMEs.

The analysis suggests that a balanced approach is essential, where continuous improvement practices, role clarity, and hierarchical coordination should be integrated with other management initiatives to promote corporate sustainability and resilience. These findings provide a solid foundation for future studies to explore additional factors and strategies that may complement these practices, aiming to maximize SME effectiveness and sustainability.

Hypothesis Testing

The hypothesis analysis is based on the interpretation of *Spearman* correlations between independent variables, representing organizational practices, and the dependent variable, corporate sustainability. This approach allows for an assessment of how different management practices influence companies' ability to remain sustainable and survive over time.

Hypothesis 1: Companies that adopt an evolutionary strategy survive longer

The analysis of the correlations between DKI1 (prioritization of continuous improvements) and DKI2 (management resources for continuous improvements) with sustainability variables (ES1 to ES4) revealed weak and negative correlations, such as -0.232202 between DKI1 and ES1 and -0.207430 between DKI2 and ES1. These results indicate a lack of strong positive association between continuous improvement practices and sustainability, which contradicts expectations based on evolutionary strategy literature.

The rejection of Hypothesis 1 is supported by the literature, which highlights that while continuous improvement can contribute to organizational efficiency, it is often insufficient for ensuring sustainability, particularly in dynamic and unpredictable environments. As Teece and Pisano (1994) suggest, firms need dynamic capabilities—the ability to reconfigure their resources rapidly in response to environmental shifts—not merely incremental adaptations. Additionally, Barney's Resource-Based View (1991) stresses that sustainability requires more than just operational improvements; it necessitates a broad set of resources and capabilities that collectively foster competitive advantage.

These findings are consistent with the argument that businesses operating in dynamic markets, such as SMEs in Mozambique, cannot rely solely on evolutionary strategies like continuous improvement. While these strategies contribute to operational excellence, they need to be complemented by more proactive and innovative capabilities to ensure long-term survival. Moreover, external factors such as market volatility, regulatory changes, and global economic shifts may moderate the impact of evolutionary strategies on business sustainability.

In conclusion, Hypothesis 1 is rejected not because continuous improvement lacks value, but because, in isolation, it does not provide the comprehensive capabilities needed for sustained business survival in an unpredictable and competitive market environment.

Hypothesis 2: Business survival results from the ability to learn and adapt to the operating environment

To test this hypothesis, *Spearman* correlations were examined between the variables DKI3 (clarity about the destination of learnings) and DKI4 (clarity about individuals' roles) and the sustainability variables. *The results were mixed*: while DKI3 exhibited weak and negative correlations, such as -0.230162 with ES1, DKI4 showed positive correlations with ES2 and ES4, such as 0.188279 and 0.187859, respectively. These values suggest that clarity about individuals' roles within SMEs may exert a moderate and positive influence on sustainability, whereas clarity about the destination of learnings did not show a significant association with sustainability. Therefore, *partial support exists for Hypothesis 2*, suggesting that success in learning and adapting may contribute to business survival, though the evidence is *insufficient for full confirmation*.

Partial support for Hypothesis 2 aligns with the "organizational learning theory" proposed by Argyris and Schön (1978), which suggests that companies that develop a learning culture and apply practical knowledge tend to adapt more effectively. However, the mixed results indicate that organizational learning is effective only when strategically directed, which is consistent with authors such as Senge (1990), who argue that learning must be intentional and applied. Thus, while role clarity may contribute to sustainability, literature supports the notion that the overall impact of learning depends on how knowledge is utilized and applied in the organizational context.

Hypothesis 3: Companies that implement the deep knowledge pillar in their management strategy survive longer

Hypothesis 3 was evaluated by analyzing Spearman correlations between the five deep knowledge-related variables (DKI1 to DKI5) and the sustainability variables (ES1 to ES4). The results revealed varied correlations, including some weak, negative correlations and others that were slightly positive. For instance, DKI5 (coordination between hierarchical levels) showed a positive correlation of 0.187859 with ES4, while DKI1 (prioritization of continuous improvements) exhibited a negative correlation of -0.232202 with ES1. These findings suggest that the deep knowledge pillar impacts sustainability in a mixed way, with certain practices, such as hierarchical coordination, showing a slight positive effect, while others, like continuous improvements, seem to have a negative association. Therefore, while Hypothesis 3 cannot be fully confirmed, the data provides evidence that certain practices related to deep knowledge may contribute to business survival under specific conditions.

The results also raise concerns regarding the isolated effects of certain deep knowledge practices. According to the Resource-Based View (RBV) theory by Barney (1991), competitive advantages are derived from valuable internal resources, such as the deep knowledge embedded within firms. While the literature supports the idea that practices like hierarchical coordination can contribute to sustainability, provided they are aligned with strategically valuable resources, the findings suggest that isolated practices such as continuous improvements may not have a direct positive impact on sustainability. This aligns with the broader literature, which emphasizes that for long-term organizational survival, a coordinated, integrated approach to resource management and internal practices is essential.

Moreover, the mixed effects observed in the correlations can be better understood by considering external factors—such as economic instability, regulatory constraints, and market volatility—that could influence the implementation and effectiveness of deep knowledge practices. For instance, macroeconomic challenges and resource limitations may hinder the adoption or proper execution of strategies like continuous improvement, potentially explaining the negative correlations with sustainability in some cases.

In future revisions, it would be beneficial to further investigate how these external factors mediate or moderate the relationship between deep knowledge practices and sustainability. Understanding how firms can align their deep knowledge resources with broader environmental conditions is key to fully grasping the nuances of their impact on survival.

General Conclusion of the Study

The analysis of *Spearman correlations* provides key insights into the relationship between management practices and corporate sustainability. However, the results suggest that the practices analyzed, such as continuous improvements and hierarchical coordination, are not clear internal determinants of business survival. Based on the available data, the conclusions are as follows:

Hypothesis 1 is rejected, as DKI1 and DKI2 did not demonstrate a significant relationship with sustainability;

Hypothesis 2 has partial support, as role clarity (DKI4) showed a weak positive relationship with sustainability;

Hypothesis 3 is also rejected, as DKI1 to DKI5 did not exhibit a strong and consistent relationship with business sustainability.

These results indicate that the examined management practices have weak and inconsistent associations with organizational sustainability. For a more detailed and robust analysis, the recommended next phase of the study would involve using complementary methods, such as complex structural equation modeling, to better investigate causal relationships and factors that effectively influence the sustainability of SMEs in Mozambique.

IV. Conclusion and Recommendations

This study provides empirical evidence that Results-Based Management (RBM) significantly enhances SME sustainability, as indicated by a positive and statistically significant coefficient ($\beta = 0.385$, $p < 0.05$). Conversely, Deep Knowledge Implementation (DKI) shows a moderate but not statistically conclusive relationship with SME sustainability ($\beta = 0.314$, $p = 0.08$), suggesting that its effectiveness may depend on complementary strategic factors. The correlation analysis further reveals that RBM is positively associated with market adaptability ($r = 0.42$, $p < 0.01$), while DKI correlates with financial performance ($r = 0.38$, $p = 0.05$), reinforcing the argument that structured knowledge application contributes to economic viability.

From a theoretical standpoint, this study extends the *Dynamic Capabilities Theory* by demonstrating how RBM serves as an operational capability that facilitates strategic adaptation in SMEs. Additionally, it strengthens the *Knowledge-Based View* (KBV), indicating that the effectiveness of DKI depends on firms' absorptive capacity, underscoring the need for structured learning mechanisms to optimize firm performance.

The managerial implications highlight the necessity for targeted interventions. Policymakers and business associations should prioritize RBM training initiatives to enhance SMEs' strategic responsiveness and long-term sustainability. Moreover, firms should invest in robust organizational learning infrastructures to maximize the impact of DKI, ensuring that knowledge absorption and application translate into tangible performance improvements.

Future research should explore the moderating effects of external factors such as regulatory frameworks and financial access on the RBM-DKI-sustainability relationship. Additionally, further investigations using longitudinal data and advanced econometric

models could provide deeper insights into causal mechanisms, offering more precise guidance for both academia and practitioners on optimizing SME sustainability strategies.

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